CLAIMS

1. A system for receiving OFDM signals via multiple outputs of a channel, comprising:

a plurality of transform processors, each transform processor converting time domain symbols received via one of said channel outputs to frequency domain symbols; and

a plurality of differential processors, each differential processor obtaining frequency domain symbols from one of said plurality of transform processors and removing differential encoding from said frequency domain symbols.

2. The system of claim 1 further comprising:

a combination processor that combines output of said differential processors to estimate transmitted data.

3. The system of claim 2 wherein said combination processor sums output of said differential processors to estimate transmitted data.

4. The system of claim 1 wherein said differential processor estimates phase differences between corresponding frequency domain symbols in successive bursts of frequency domain symbols.

5. The system of claim 1 wherein said differential processor estimates phase differences between successive frequency domain symbols within a burst.

6. The system of claim 1 wherein differences between pairs of frequency domain symbols represent multiple bits and further comprising:

a cost metric value processor that responsive to outputs of said differential processors estimates soft decision values for each of said multiple bits.

7. A system for transmitting OFDM signals via a channel comprising:

a differential processor that differentially encodes frequency domain symbols to be transmitted; and

a transform processor that transforms bursts of said frequency domain symbols into bursts of time domain symbols wherein at least selected ones of said frequency domain symbols are repeated within said bursts.

8. The system of claim 7 further comprising:

a transmitter system for transmitting said time domain symbols via at least one antenna.

9. The system of claim 7 wherein said transform processor comprises an IFFT processor.

10. A system for receiving OFDM signals via a channel comprising:

a transform processor that transforms a burst of time domain symbols into a burst of frequency domain symbols; and

a plurality of differential processors, each of said differential processors obtaining as input frequency domain symbols from a corresponding segment of said burst, said differential processors differentially decoding said frequency domain symbols.

11. The system of claim 11 further comprising a combination processor that combines output of said differential processors to estimate transmitted data.

12. The system of claim 11 wherein said combination processor averages output of said differential processors to estimate transmitted data.

13. The system of claim 11 wherein said differential processor estimates phase differences between corresponding frequency domain symbols in successive bursts of frequency domain symbols.

14. The system of claim 11 wherein said differential processor estimates phase differences between successive frequency domain symbols within a burst.

15. The system of claim 11 wherein differences between pairs of frequency domain symbols represent multiple bits and further comprising:

a cost metric value processor that responsive to outputs of said differential processors estimates soft decision values for each of said multiple bits.

16. A method for obtaining a soft decision value for a particular bit of a multibit phase shift key symbol, said method comprising:

forming a received estimate of said multibit phase shift key symbol;

obtaining a first angular difference between polar coordinates of

said received estimate and polar coordinates of a nearest in angle ideal symbol having zero as a value for said particular bit;

obtaining a second angular difference between polar coordinates of said received estimate and polar coordinates of a nearest in angle ideal symbol having one as a value for said particular bit; and

forming a soft decision value for said particular bit based on said first angular difference and said second angular difference.

17. The method of claim 16 wherein said soft decision value is formed further based on an amplitude of said received estimate, said amplitude acting as a confidence value.

18. The method of claim 16 wherein said phase shift key symbol comprises a detection symbol in a DPSK system.

19. A method for obtaining a soft decision value for a particular bit of a multibit phase shift key symbol, said method comprising:

forming a received estimate of said multibit phase shift key symbol; and

forming a soft decision value for said particular bit based on angular differences between said received estimate and ideal values for said multibit phase shift key symbol.